

CLAIMS

WHAT IS CLAIMED IS:

1. A cross-shaped laser rays generator, comprising:

5 a laser source, providing an emitting end and being capable of emitting laser rays;

a collimator lens element, providing a reflection emitting end and being disposed at the emitting end of the laser source; and

10 a non-spherical lens element, being disposed at the reflection emitting end of the collimator lens element, at a side thereof including a first curved surface, a second curved surface, a third curved surface and a fourth curved surface with the first curved surface being opposite to the third curved surface and the second curved surface being
15 opposite to the fourth curved surface, the first and the third curved surfaces connecting with the second and the fourth curved surfaces with an undeviating laser rays area formed at an intersection of the four curved surfaces;

20 whereby, diverging laser rays emitted from the laser source project to the collimator lens element and are refracted via the collimator lens element to become parallel beams projecting to the non-spherical lens element and then the parallel beams are refracted as two orthogonal laser rays
25 via the non-spherical lens element with part of the parallel beams piercing the undeviating laser ray area and projecting to an intersection point of the two orthogonal laser rays such that the intersection point is provided with a brighter light point.

30 2. The cross-shaped laser rays generator according to claim 1, wherein the undeviating laser rays area is at an

uppermost spot of the curved surfaces.

3. The cross-shaped laser rays generator according to claim 1, wherein the undeviating laser rays area is disposed below an uppermost spot of the curved surfaces.

5 4. The cross-shaped laser rays generator according to claim 1, wherein the undeviating laser rays area is a through hole communicating with two sides of the non-spherical lens element.

10 5. The cross-shaped laser rays generator according to claim 1, wherein the undeviating laser rays area is a flat surface respectively parallel disposed at two sides of the non-spherical lens element.

15 6. The cross-shaped laser rays generator according to claim 1, wherein the non-spherical lens element at another side thereof is provided with a shape of plane.

7. The cross-shaped laser rays generator according to claim 1, wherein the two sides of the non-spherical lens element are symmetrical to each other.

8. A cross-shaped laser rays generator, comprising:

20 a laser source, providing an emitting end and being capable of emitting laser rays;

 a collimator lens element, providing a reflection emitting end and being disposed at the emitting end of the laser source; and

25 a non-spherical lens element, being disposed at the reflection emitting end of the collimator lens element, at a side thereof including a first curved surface, a second curved surface, a third curved surface and a fourth curved surface with the first curved surface being opposite to the
30 third curved surface and the second curved surface being

opposite to the fourth curved surface, the first and the third curved surfaces connecting with the second and the fourth curved surfaces with the curved surfaces bending toward two lateral sides from an uppermost spot thereof respectively and an intersection of the four curved surfaces being below the uppermost spots;

whereby, diverging laser rays emitted from the laser source project to the collimator lens element and are refracted via the collimator lens element to become parallel beams projecting to the non-spherical lens element and then the parallel beams are refracted as two orthogonal laser rays via the non-spherical lens element.

9. A non-spherical lens element, being used for allowing parallel beams being refracted as two orthogonal and cross-shaped laser rays, comprising

a side, having a first curved surface, a second curved surface, a third curved surface and a fourth curved surface with the first curved surface being opposite to the third curved surface and the second curved surface being opposite to the fourth curved surface, the first and the third curved surfaces connecting with the second and the fourth curved surfaces with an undeviating laser ray area formed at an intersection of the four curved surfaces;

whereby, parallel beams can be refracted as two orthogonal and cross-shaped laser rays via the non-spherical lens element with part of the parallel beams piercing the undeviating laser ray area and projecting to an intersection point of the two orthogonal laser rays such that the intersection point is provided with a brighter light point.

10. The non-spherical lens element according to claim

9, wherein the undeviating laser rays area is at an uppermost spot of the curved surfaces.

11. The non-spherical lens element according to claim 9, wherein the undeviating laser rays area is disposed below the uppermost spot of the curved surfaces.

12. The non-spherical lens element according to claim 9, wherein the undeviating laser rays area is a through hole communicating with two sides of the non-spherical lens element.

13. The non-spherical lens element according to claim 9, wherein the undeviating laser rays area is a flat surfaces respectively parallel disposed at two sides of the non-spherical lens element.

14. The non-spherical lens element according to claim 9, wherein the non-spherical lens element at another side thereof is provided with a shape of plane.

15. The non-spherical lens element according to claim 9, the two sides of the non-spherical lens element are symmetrical to each other.

16. A non-spherical lens element, being used for allowing parallel beams being refracted as two orthogonal and cross-shaped laser rays, comprising

a side, having a first curved surface, a second curved surface, a third curved surface and a fourth curved surface with the first curved surface being opposite to the third curved surface and the second curved surface being opposite to the fourth curved surface, the first and the third curved surfaces connecting with the second and the fourth curved surfaces with the curved surfaces bending toward two lateral sides from an uppermost spot thereof

respectively and an intersection of the curved surfaces being disposed below the uppermost spots;

whereby, parallel beams can be refracted as two orthogonal and cross-shaped laser rays via the non-spherical lens element.

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